PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 25 August 1999 (25.08.99)	
International application No. PCT/IB99/00046	**Applicant's or agent's file reference** FR001A
International filing date (day/month/year) 18 January 1999 (18.01.99)	**Priority date** (day/month/year) 20 January 1998 (20.01.98)
Applicant POLO FILISAN, Andrea	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

11 August 1999 (11.08.99)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer C. Carrié
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Form PCT/IB/331 (July 1992)

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
FR001A		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB99/00046	18/01/1999	20/01/1998
International Patent Classification (IPC) or national classification and IPC		
H04N7/10		
Applicant		
FRACARRO RADIOINDUSTRIE S.P.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 11 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
11/08/1999	08.05.00
Name and mailing address of the international preliminary examining authority:	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Berst, C Telephone No. +49 89 2399 8028

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB99/00046

I. Basis of the report

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Description, pages:

1,3-18	as originally filed	
2	with telefax of	18/02/2000

Claims, No.:

1-53	with telefax of	18/02/2000

Drawings, sheets:

1/8-8/8	as originally filed

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4. Additional observations, if necessary:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB99/00046

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1-39, 41-53
	No:	Claims 40
Inventive step (IS)	Yes:	Claims 1-39, 41-53
	No:	Claims 40
Industrial applicability (IA)	Yes:	Claims 1-53
	No:	Claims

2. Citations and explanations

see separate sheet

VII. Certain defects in the international application

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see separate sheet

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In the present application, in order to perform the repartition of data over the available frequencies, the signals which have a known reserved destination are accordingly frequency converted and modulated in a given frequency portion, or channel, the frequency converter being remotely user controlled.

Such a specific controlled frequency conversion is neither disclosed nor rendered obvious by the prior art document cited in the International Search Report.

The features of independent claims 1 and 50 are based on claim 1 and on page 4, lines 6 - 10, page 5, lines 9 - 22 as well as on figure 3 as originally filed.

For these reasons, independent claims 1 and 50 satisfy the requirements of the PCT with respect to Articles 33 (1)-(4).

Claims 2 - 39 and 41 - 49 are dependent on claim 1 and claims 51 - 53 are dependent on claim 50. They therefore also meet said requirements of the PCT.

2) The ambiguous subject matter of claim 40 (see section VIII of the present report) is known from D1, where a transponder is used in relationship with specific different channels for the different signals (see figure 1).

For this reason, the subject-matter of claim 40 is not new and this claim does not meet the requirements of Article 33(2) PCT.

VII). Certain defects:

a) In the last paragraph of page 2, the passage "condominium and/or community environment." is missing.

b) The independent claims are not in a correct two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with **all** those features known in combination from the prior art (see document D1) being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).

VIII). Certain observations - Clarity:

a) Claim 40 is totally unclear (Article 6 PCT), since it does not comprise any of the features essential for carrying out the invention. This is due to claim 40 referring back to itself.

b) It is clear from the description that the feature of "performing the remote control of the frequency conversion **by the user**" is essential to the definition of the present invention. Since independent claim 50 does not contain this feature, it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain **all** the technical features essential to the definition of the invention.

improper text sequence

distribution system through smart cards, in order to decode the programs purchased under exclusivity.

Now, installation complexity for the systems already known will obviously increase to a considerable extent due to all these further functions required for the distribution system.

From document US-A-5 574 964 is known a system for the distribution of multiple received signals having different formats using a single pre-existing network.

The system there disclosed provides for a preliminary conversion of all received signals in a bus signal having a certain bandwidth (1GHz). Said bus signal runs on a bus constituting the distribution network. Each received signal is converted in a predetermined, frequency position place on the span of said bandwidth. A control computer interfaced to the bus, also adds addresses and commands in predetermined frequency position to the bus signals, according to the user needs.

From document EP-A-0 457 673, is known a control system of audio-video reproducing apparatuses in a community. Said system is so conceived that the audiovideo information coming out from each electronic apparatus is frequency multiplexed in a specific channel on a common bus signal. Further, a channel content information is provided, indicating the audio video information allocated to the respective channels and an information indicating the room (the socket) using the electronic apparatus and its related channel. The reason for giving such informations is to let the other users know the channels and apparatuses that are in use, in order to avoid the selection of said used channels and the disturbance of the system.

The present invention has the aim of providing a distribution system which, by solving the above drawbacks, allows for the distribution of a plurality of services in a condominium and/or community environment, independently from the type of standards of the signals received and the time when such signals become available; which also allows gradual implementation of the system based on the free decision of each individual user, obviously without affecting the service already supplied by the system.

A further aim of the present invention is to provide a distribution system of digital signals in a condominium and/or community environment, which allows each user to use said digital signals in a bi-directional way, without affecting the service already supplied by the system.

A further aim of the present invention is to provide a fast installation of the system associated with the use of a smart card, while protecting the broadcaster's interests and the user's privacy.

In order to achieve such aims, it is the object of the present invention a distribution system in a condominium and/or community environment incorporating the features of the annexed claims, which form an integral part of the present description.

Further objects and advantages of the present invention will become apparent from the following detailed description and annexed drawings, which are supplied by way of non limiting example, wherein:

- Fig. 1 shows the subdivision of the frequency band used for the signal distribution;
- Fig. 2 shows a known distribution system of a plurality of signals in a

CLAIMS

1. A system for the distribution to a condominium and/or community environment of a plurality of information signals, comprising digital signals, entering said environment and being transmitted according to different standards, comprising means (1,4,14',19) for receiving said digital signals, means (2,5,7) for the amplification and the standard frequency conversion of said digital signals, means (3) for mixing said information signals on a distribution network (8) to a plurality of signal sockets (9), at least a part of said digital signals being reserved to predetermined signal sockets (9) among said plurality, characterized in that, for each of said predetermined signal socket (9), the system provides further means (13, 14, 20) for frequency converting one or more of the received reserved digital signals in reserved frequency portions (S1), or personal channels, of the band, said personal channels being reserved to the corresponding predetermined signal sockets (9), and forbidden to the remaining sockets (9) through means (15, 16) for allowing access to said personal channels (S1) of the band only to the corresponding signal sockets (9), said means (13, 14, 20) for frequency converting one or more of the received digital signals in personal channels (S1) of the band being commanded through respective user control means (11, 17, 18; 40; 51).

2. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said means (13, 14, 20) for frequency converting one or more of the received digital signals in personal channels (S1) of the band make use of the same type of modulation (QAM) for each socket (9).

3. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the distribution network (8) of the information signals comprise a distribution support (8) realized by means of a coaxial cable.

4. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the distribution network (8) for the distribution of said information signals comprise MMDS and/or LMDS networks.

5. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said personal channel is 8 MHz wide.

6. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the digital signal being present in said personal channel is QAM modulated.

7. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said personal channel is contained in a frequency band being comprised between 47 to 862 MHz.

8. A system for the distribution to a condominium and/or community environment, according to claim 7, characterized in that said frequency band ranges preferably from 230 to 445 MHz.

9. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the means (15, 16) for allowing access to said personal channels (S1) comprises means (15,16) for filtering the personal channel, that are located upstream the signal socket (9).

10. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said filtering means (15, 16) comprises a band-stop filter (15), apt to eliminate the reception of the personal channels, by a receiver (18) through the signal socket (9).

11. A system for the distribution to a condominium and/or community environment, according to claim 10, characterized in that said filtering means (15, 16) further comprises, in correspondence of a predetermined signal socket (9), a

channel-pass filter (16) is arranged in parallel to said band-stop filter (15), which is apt to let the personal channel pass through to the single user.

12. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the selection of the digital signal to be converted in said personal channel is performed by a return-channel.

13. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is FSK modulated.

14. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is PSK modulated.

15. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is QPSK modulated.

16. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is QAM modulated.

17. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is bi-directional under TDMA procedure.

18. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel has a band width of 128 KHz or multiples of it.

19. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is comprised between 41 and 46.5 MHz.

20. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel uses the same coaxial cable of distribution network (8) of the system.

21. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that the return channel used by a user is not accessible to all other users of the system.

22. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is radiofrequency irradiated.

23. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the means (13, 14, 20) for frequency converting one or more of the received reserved digital signals in reserved frequency portions (S1), or personal channels, of the band are obtained by means of a transmodulator (13,20;29;41,42,43,44).

24. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that a user terminal (17) and an IRD receiver-decoder (18;40;51) are provided at the signal socket (9), which can be operated by a same remote-control (11).

25. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that two or more means (13, 14, 20) for frequency converting one or more of the received digital signals in personal channels (S1) (13,14,20) are contained in a sole transmodulator device (29).

26. A system for the distribution to a condominium and/or community environment, according to claim 25, characterized in that said sole transmodulator device (29) comprises tuner means (30,32,34), which are apt to perform the selection of said digital signals within at least two frequency ranges, and demodulation means (31,33,35), which are apt to demodulate at least two of said digital signals transmitted with different standards.

27. A system for the distribution to a condominium and/or community environment, according to claim 26, characterized in that said transmodulator device (29) includes at least two tuners (30,32,34) for the selection of digital signals, and at least two demodulators (31,33,35) of said digital signals.

28. A system for the distribution to a condominium and/or community environment, according to claim 26, characterized in that said transmodulator device (29) also includes a commutator (36) apt for receiving the digital signals coming from said demodulators (31,33,35).

29. A system for the distribution to a condominium and/or community environment, according to claim 27, characterized in that said transmodulator device (29) also comprises a modulator (37) for remodulating the output signal of the commutator (36).

30. A system for the distribution to a condominium and/or community environment, according to claim 27, characterized in that said transmodulator device (29) also includes a converter (38) for converting in frequency the output signal of said modulator (37) into a personal channel.

31. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said user control means (11,17,18;40) are also apt to generate one or more digital signals in transmission or upstream signals (US) and convert them in frequency into the personal channel, and that second selection and handling means (41,43) are provided for said digital signals in transmission, and means (4,14') for the transmission of said upstream signals (US) from satellite and/or by cable.

32. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that transmodulator means (42,44) and the second selection means (41,43) operate on the received downstream signals (DS) or on upstream signals (US) QAM modulated under SCPC procedure, respectively.

33. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that said personal channel which can be accessed by said user only is used under FDMA procedure, i.e. the upstream signals (US) and downstream signals (DS) are simultaneously present in said personal channel.

34. A system for the distribution to a condominium and/or community environment, according to claim 33, characterized in that in said personal channel both the upstream signals (US) and the downstream signals (DS) occupy not overlapping frequency bands.

35. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that the personal channel is used under TDMA procedure, i.e. both the upstream signals (US) and the downstream signals (DS) are not simultaneously present in the personal channel.

36. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that said transmodulator means (42,44) and said second selection and handling means (41,43) are comprised in a single container.

37. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the user control means (11, 17, 18; 40; 51) comprise a receiver (51) apt to perform an access function to a plurality of conditioned access services, by reading the information contained in a smart card (52), and that that said information contained in said smart card (52) control the means (13, 14, 20) for frequency converting one or more of the received reserved digital signals in the personal channel.

38. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained in the smart card (52) comprise information for tuning transmodulator means (13,14,20;29;41,42,43,44).

39. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained in the smart card (52) comprise information for the tuning of transponder preselection means (12).

40. A system for the distribution to a condominium and/or community environment, according to claim 40, characterized in that the information for the tuning of the transponder preselection means (12) are selection information of the bands of the channels to be tuned.

41. A system for the distribution to a condominium and/or community environment, according to claim 38, characterized in that information for the tuning of the transponder preselection means (12) are information for determining the polarization of the channels to be tuned.

42. A system for the distribution to a condominium and/or community environment, according to claim 38, characterized in that said information contained in the smart card (52) comprise frequencies information of the channels to be tuned.

43. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained in the smart card (52) also comprise frequency information of said personal channel.

44. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that the selection means (12,13,14,20;29;41,42,43,44) and the smart card (52) contain respective electronic keys, whose congruence enables the operation of said distribution system of a plurality of signals to a condominium and/or community environment.

45. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that the control means (51) contain a device for writing data in a program memory of a microprocessor contained in the smart card (52).

46. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that said program memory is an EEPROM type memory.

47. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that the device for writing data in a program memory of a microprocessor contained in the smart card (52) operates on data sent to the control means (51) by modem.

48. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that said device for writing data in a program memory of a microprocessor contained in the smart card (52) operates on data sent to the control means (51) by means of the Service Information contained in the received digital signal.

49. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said means (15, 16) for allowing access to said personal channels (S1) are apt to prevent the passage of signals generated inside a further distribution network associated to a signal socket (9), in particular being inside a dwelling or flat.

50. Method for the distribution to a condominium and/or community environment, of a plurality of information signals, including digitals signals, at least some of digital signals being reserved to predetermined signal socket in the environment, comprising the steps of:

- receiving said information signals, comprising digital signals;
- operating a frequency conversion of the received digital signals;
- mixing said digital signals on a distribution network (8) that distribute said digital signals to the sockets (9)
- controlling the digital signals received by a specific socket (9) through remote control means

characterized in that

the step of operating the frequency conversion of the received digital signals comprises the step of operating the frequency conversion of each reserved digital signal required by a specific socket in a reserved frequency portion (S1), or personal channels, that is exclusively associated with a sockets, and in that the steps of controlling the digital signals comprises the step of remote controlling the operation of frequency conversion of each reserved digital signal required by a specific socket in a reserved frequency portion (S1), for the purpose of selecting the content of said reserved frequency portion (S1).

51. Method for the distribution to a condominium and/or community environment, of a plurality of information signals according to claim 50, characterized in that further provides the step of operating a frequency selection in the frequency portion of each personal channel (S1), between the distribution network (8) and a receiver (18) associated to the respective personal channel (S1).

52. Method for the distribution to a condominium and/or community environment, of a plurality of information signals according to claim 51, characterized in that further provides the step of frequency filtering the frequency portions associated to the personal channels (S1) between the distribution network (8) and a receiver (18).

53. Method for the distribution to a condominium and/or community environment, of a plurality of information signals according to claim 51, characterized in that the step of operating the frequency conversion of each reserved digital signal required by a specific socket in a reserved frequency portion (S1), or personal channels, converts said reserved digital signals in unique type of modulation (QAM).

ABSTRACT

The present industrial invention concerns a system for the distribution in a condominium and/or community environment of a plurality of television signals, and/or audio signals, and/or digital audio and/or video signals transmitted with different standards. According to the invention, one or more digital signals can be received by a single user of the system by means of a frequency conversion into a personal channel, which can be accessed by said user only. Moreover, the digital signal being present in said channel always has the same modulation and can be selected by said user through control means which send a control signal to selection means.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
FR001A		
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Date of submission of the demand	Date of completion of this report
11/08/1999	08.05.00
Name and mailing address of the international preliminary examining authority:	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Berst, C Telephone No. +49 89 2399 8028

Form PCT/IPEA/409 (cover sheet) (January 1994)

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International application No. PCT/IB99/00046

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VII). Certain defects:

a) In the last paragraph of page 2, the passage "condominium and/or community environment." is missing.

b) The independent claims are not in a correct two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with **all** those features known in combination from the prior art (see document D1) being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).

VIII). Certain observations - Clarity:

a) Claim 40 is totally unclear (Article 6 PCT), since it does not comprise any of the features essential for carrying out the invention. This is due to claim 40 referring back to itself.

b) It is clear from the description that the feature of "performing the remote control of the frequency conversion **by the user**" is essential to the definition of the present invention. Since independent claim 50 does not contain this feature, it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain **all** the technical features essential to the definition of the invention.

distribution system through smart cards, in order to decode the programs purchased under exclusivity.

Now, installation complexity for the systems already known will obviously increase to a considerable extent due to all these further functions required for the distribution system.

From document US-A-5 574 964 is known a system for the distribution of multiple received signals having different formats using a single pre-existing network.

The system there disclosed provides for a preliminary conversion of all received signals in a bus signal having a certain bandwidth (1GHz). Said bus signal runs on a bus constituting the distribution network. Each received signal is converted in a predetermined, frequency position place on the span of said bandwidth. A control computer interfaced to the bus, also adds addresses and commands in predetermined frequency position to the bus signals, according to the user needs.

From document EP-A-0 457 673, is known a control system of audio-video reproducing apparatuses in a community. Said system is so conceived that the audiovideo information coming out from each electronic apparatus is frequency multiplexed in a specific channel on a common bus signal. Further, a channel content information is provided, indicating the audio video information allocated to the respective channels and an information indicating the room (the socket) using the electronic apparatus and its related channel. The reason for giving such informations is to let the other users know the channels and apparatuses that are in use, in order to avoid the selection of said used channels and the disturbance of the system.

The present invention has the aim of providing a distribution system which, by solving the above drawbacks, allows for the distribution of a plurality of services in a condominium and/or community environment, independently from the type of standards of the signals received and the time when such signals become available; which also allows gradual impiementation of the system based on the free decision of each individual user, obviously without affecting the service already supplied by the system.

A further aim of the present invention is to provide a distribution system of digital signals in a condominium and/or community environment, which allows each user to use said digital signals in a bi-directional way, without affecting the service already supplied by the system.

A further aim of the present invention is to provide a fast installation of the system associated with the use of a smart card, while protecting the broadcaster's interests and the user's privacy.

In order to achieve such aims, it is the object of the present invention a distribution system in a condominium and/or community environment incorporating the features of the annexed claims, which form an integral part of the present description.

Further objects and advantages of the present invention will become apparent from the following detailed description and annexed drawings, which are supplied by way of non limiting example, wherein:

- Fig. 1 shows the subdivision of the frequency band used for the signal distribution;
- Fig. 2 shows a known distribution system of a plurality of signals in a

CLAIMS

1. A system for the distribution to a condominium and/or community environment of a plurality of information signals, comprising digital signals, entering said environment and being transmitted according to different standards, comprising means (1,4,14',19) for receiving said digital signals, means (2,5,7) for the amplification and the standard frequency conversion of said digital signals, means (3) for mixing said information signals on a distribution network (8) to a plurality of signal sockets (9), at least a part of said digital signals being reserved to predetermined signal sockets (9) among said plurality, characterized in that, for each of said predetermined signal socket (9), the system provides further means (13, 14, 20) for frequency converting one or more of the received reserved digital signals in reserved frequency portions (S1), or personal channels, of the band, said personal channels being reserved to the corresponding predetermined signal sockets (9), and forbidden to the remaining sockets (9) through means (15, 16) for allowing access to said personal channels (S1) of the band only to the corresponding signal sockets (9), said means (13, 14, 20) for frequency converting one or more of the received digital signals in personal channels (S1) of the band being commanded through respective user control means (11, 17, 18; 40; 51).

2. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said means (13, 14, 20) for frequency converting one or more of the received digital signals in personal channels (S1) of the band make use of the same type of modulation (QAM) for each socket (9).

3. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the distribution network (8) of the information signals comprise a distribution support (8) realized by means of a coaxial cable.

4. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the distribution network (8) for the distribution of said information signals comprise MMDS and/or LMDS networks.

5. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said personal channel is 8 MHz wide.

6. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the digital signal being present in said personal channel is QAM modulated.

7. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said personal channel is contained in a frequency band being comprised between 47 to 862 MHz.

8. A system for the distribution to a condominium and/or community environment, according to claim 7, characterized in that said frequency band ranges preferably from 230 to 445 MHz.

9. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the means (15, 16) for allowing access to said personal channels (S1) comprises means (15,16) for filtering the personal channel, that are located upstream the signal socket (9).

10. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said filtering means (15, 16) comprises a band-stop filter (15), apt to eliminate the reception of the personal channels, by a receiver (18) through the signal socket (9).

11. A system for the distribution to a condominium and/or community environment, according to claim 10, characterized in that said filtering means (15, 16) further comprises, in correspondence of a predetermined signal socket (9), a

channel-pass filter (16) is arranged in parallel to said band-stop filter (15), which is apt to let the personal channel pass through to the single user.

12. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the selection of the digital signal to be converted in said personal channel is performed by a return-channel.

13. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is FSK modulated.

14. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is PSK modulated.

15. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is QPSK modulated.

16. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is QAM modulated.

17. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is bi-directional under TDMA procedure.

18. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel has a band width of 128 KHz or multiples of it.

19. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is comprised between 41 and 46.5 MHz.

20. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel uses the same coaxial cable of distribution network (8) of the system.

21. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that the return channel used by a user is not accessible to all other users of the system.

22. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is radiofrequency irradiated.

23. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the means (13, 14, 20) for frequency converting one or more of the received reserved digital signals in reserved frequency portions (S1), or personal channels, of the band are obtained by means of a transmodulator (13,20;29;41,42,43,44).

24. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that a user terminal (17) and an IRD receiver-decoder (18;40;51) are provided at the signal socket (9), which can be operated by a same remote-control (11).

25. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that two or more means (13, 14, 20) for frequency converting one or more of the received digital signals in personal channels (S1) (13,14,20) are contained in a sole transmodulator device (29).

26. A system for the distribution to a condominium and/or community environment, according to claim 25, characterized in that said sole transmodulator device (29) comprises tuner means (30,32,34), which are apt to perform the selection of said digital signals within at least two frequency ranges, and demodulation means (31,33,35), which are apt to demodulate at least two of said digital signals transmitted with different standards.

27. A system for the distribution to a condominium and/or community environment, according to claim 26, characterized in that said transmodulator device (29) includes at least two tuners (30,32,34) for the selection of digital signals, and at least two demodulators (31,33,35) of said digital signals.

28. A system for the distribution to a condominium and/or community environment, according to claim 26, characterized in that said transmodulator device (29) also includes a commutator (36) apt for receiving the digital signals coming from said demodulators (31,33,35).

29. A system for the distribution to a condominium and/or community environment, according to claim 27, characterized in that said transmodulator device (29) also comprises a modulator (37) for remodulating the output signal of the commutator (36).

30. A system for the distribution to a condominium and/or community environment, according to claim 27, characterized in that said transmodulator device (29) also includes a converter (38) for converting in frequency the output signal of said modulator (37) into a personal channel.

31. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said user control means (11,17,18;40) are also apt to generate one or more digital signals in transmission or upstream signals (US) and convert them in frequency into the personal channel, and that second selection and handling means (41,43) are provided for said digital signals in transmission, and means (4,14') for the transmission of said upstream signals (US) from satellite and/or by cable.

32. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that transmodulator means (42,44) and the second selection means (41,43) operate on the received downstream signals (DS) or on upstream signals (US) QAM modulated under SCPC procedure, respectively.

33. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that said personal channel which can be accessed by said user only is used under FDMA procedure, i.e. the upstream signals (US) and downstream signals (DS) are simultaneously present in said personal channel.

34. A system for the distribution to a condominium and/or community environment, according to claim 33, characterized in that in said personal channel both the upstream signals (US) and the downstream signals (DS) occupy not overlapping frequency bands.

35. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that the personal channel is used under TDMA procedure, i.e. both the upstream signals (US) and the downstream signals (DS) are not simultaneously present in the personal channel.

36. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that said transmodulator means (42,44) and said second selection and handling means (41,43) are comprised in a single container.

37. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the user control means (11, 17, 18; 40; 51) comprise a receiver (51) apt to perform an access function to a plurality of conditioned access services, by reading the information contained in a smart card (52), and that that said information contained in said smart card (52) control the means (13, 14, 20) for frequency converting one or more of the received reserved digital signals in the personal channel.

38. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained in the smart card (52) comprise information for tuning transmodulator means (13,14,20;29;41,42,43,44).

39. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained in the smart card (52) comprise information for the tuning of transponder preselection means (12).

40. A system for the distribution to a condominium and/or community environment, according to claim 40, characterized in that the information for the tuning of the transponder preselection means (12) are selection information of the bands of the channels to be tuned.

41. A system for the distribution to a condominium and/or community environment, according to claim 38, characterized in that information for the tuning of the transponder preselection means (12) are information for determining the polarization of the channels to be tuned.

42. A system for the distribution to a condominium and/or community environment, according to claim 38, characterized in that said information contained in the smart card (52) comprise frequencies information of the channels to be tuned.

43. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained in the smart card (52) also comprise frequency information of said personal channel.

44. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that the selection means (12,13,14,20;29;41,42,43,44) and the smart card (52) contain respective electronic keys, whose congruence enables the operation of said distribution system of a plurality of signals to a condominium and/or community environment.

45. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that the control means (51) contain a device for writing data in a program memory of a microprocessor contained in the smart card (52).

46. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that said program memory is an EEPROM type memory.

47. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that the device for writing data in a program memory of a microprocessor contained in the smart card (52) operates on data sent to the control means (51) by modem.

48. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that said device for writing data in a program memory of a microprocessor contained in the smart card (52) operates on data sent to the control means (51) by means of the Service Information contained in the received digital signal.

49. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said means (15, 16) for allowing access to said personal channels (S1) are apt to prevent the passage of signals generated inside a further distribution network associated to a signal socket (9), in particular being inside a dwelling or flat.

50. Method for the distribution to a condominium and/or community environment, of a plurality of information signals, including digitals signals, at least some of digital signals being reserved to predetermined signal socket in the environment, comprising the steps of:

- receiving said information signals, comprising digital signals;
- operating a frequency conversion of the received digital signals;
- mixing said digital signals on a distribution network (8) that distribute said digital signals to the sockets (9)
- controlling the digital signals received by a specific socket (9) through remote control means

characterized in that

the step of operating the frequency conversion of the received digital signals comprises the step of operating the frequency conversion of each reserved digital signal required by a specific socket in a reserved frequency portion (S1), or personal channels, that is exclusively associated with a sockets, and in that the steps of controlling the digital signals comprises the step of remote controlling the operation of frequency conversion of each reserved digital signal required by a specific socket in a reserved frequency portion (S1), for the purpose of selecting the content of said reserved frequency portion (S1).

51. Method for the distribution to a condominium and/or community environment, of a plurality of information signals according to claim 50, characterized in that further provides the step of operating a frequency selection in the frequency portion of each personal channel (S1), between the distribution network (8) and a receiver (18) associated to the respective personal channel (S1).

52. Method for the distribution to a condominium and/or community environment, of a plurality of information signals according to claim 51, characterized in that further provides the step of frequency filtering the frequency portions associated to the personal channels (S1) between the distribution network (8) and a receiver (18).

53. Method for the distribution to a condominium and/or community environment, of a plurality of information signals according to claim 51, characterized in that the step of operating the frequency conversion of each reserved digital signal required by a specific socket in a reserved frequency portion (S1), or personal channels, converts said reserved digital signals in unique type of modulation (QAM).

ABSTRACT

The present industrial invention concerns a system for the distribution in a condominium and/or community environment of a plurality of television signals, and/or audio signals, and/or digital audio and/or video signals transmitted with different standards. According to the invention, one or more digital signals can be received by a single user of the system by means of a frequency conversion into a personal channel, which can be accessed by said user only. Moreover, the digital signal being present in said channel always has the same modulation and can be selected by said user through control means which send a control signal to selection means.

AS

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
FR001A		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/IB 99/00046	18/01/1999	20/01/1998
Applicant		
FRACARRO RADIOINDUSTRIE S.P.A. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language,** the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

[ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

[ ] contained in the international application in written form.

[ ] filed together with the international application in computer readable form.

[ ] furnished subsequently to this Authority in written form.

[ ] furnished subsequently to this Authority in computer readble form.

[ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

[ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

[X] the text is approved as submitted by the applicant.

[ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

[X] the text is approved as submitted by the applicant.

[ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 3

[X] as suggested by the applicant.

[ ] because the applicant failed to suggest a figure.

[ ] because this figure better characterizes the invention.

[ ] None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/00046

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04N7/10 H04N7/16

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	US 5 574 964 A (HAMLIN CHRISTOPHER L) 12 November 1996 see column 2, line 54 - column 7, line 40 see figures 1-5 ---	1,3,5,7, 8,23,24, 28-33 40-42, 45-51 5,10-12, 20-22, 25,27
Y	WO 96 41438 A (VTECH COMMUNICATIONS INC ;VTECH COMMUNICATIONS LTD (GB)) 19 December 1996 see page 9, line 7 - line 28 see page 16, line 1 - page 17, line 7 see page 19, line 22 - page 20, line 2 --- -/--	40-42, 45-51

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 April 1999	03/05/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Van der Zaal, R

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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
[redacted]T/IB 99/00046

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 497 186 A (KAWASAKI MASAHIKO) 5 March 1996 see column 2, line 45 - column 5, line 48 see figures 2-6	1,3,5,7, 8,12,13, 20,21,25
A	EP 0 457 673 A (SONY CORP) 21 November 1991	
A	DE 40 12 657 A (COMTEC AG) 24 October 1991	

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INTERNATIONAL SEARCH REPORT

[redacted]ation on patent family members

International Application No
[redacted]T/IB 99/00046

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